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Multilevel analysis of municipal officials' participation in land use policies supportive of active living: City and individual factors

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Abstract

Purpose—To investigate individual- and city-level factors associated with municipal officials' participation in a local land use policy that supports active living.

Design—Cross-sectional study.

Setting—83 cities in 8 states.

Subjects—413 elected and appointed officials, with various job functions including mayors, city councilors, aldermen, selectmen, city or town managers, and heads of departments of planning, community development, public works, transportation, engineering, parks and recreation, neighborhood services, and public health.

Measures—A web-based survey assessed: perceived importance of physical activity and livability issues to job responsibilities; perceived resident support of local government action to address physical activity and livability issues; and residence. City-level factors obtained from Census data included: percentage of commuters by walking, bicycling, and public transit. The dependent variable was self-reported participation in developing, adopting, or implementing a local land use policy supportive of active living.

Analysis—Hierarchical (two-level: municipal official-city) logistic regression model, using R.

Results—Municipal officials living in the city where they worked were significantly more likely to be involved in a land use policy. Higher perceived importance of livability issues was associated with participation. Perceived importance of physical activity was inversely associated with land use policy involvement. Higher city-level bicycling rates resulted in increased odds of participation in a land use policy. City-level walking rates were inversely associated with land use policy participation.

Conclusion—Municipal officials working in cities with a higher proportion of bicycle commuters, who prioritized livability issues, and who resided in the city where they worked, were more likely to engage in land use policies supportive of active living.

Keywords

Physical activity; land use; policy

Indexing Key Words

Manuscript format: research; Research purpose: Relationship testing; Study design: Non-experimental; Outcome measure: Behavioral; Setting: Local community; Health focus: Physical activity; Strategy: Policy; Target population age: Adults; Target population circumstances: N/A

Purpose

Elected and appointed local officials can support healthy community design through land use policies that encourage active living.[1] An emerging body of evidence has explored the motivations of local officials for participating in the development, adoption, and implementation of policies supportive of physical activity.[2–5] For example, Dill and Howe found that physical activity was not a common motivator for adopting innovative land use policies among local planning officials, whereas livability was an important consideration.[3] Although this research has provided insight on the intrapersonal motivations for local officials to be engaged in land use policies, it is also important to understand how contextual factors may influence local officials' participation in these policies. Therefore, the purpose of this study was to examine individual- and city-level predictors of involvement in land use policies supportive of active living among municipal officials.

Methods

Design

A cross-sectional survey was administered online in 2012.

Sample

Eligibility criteria included elected and appointed officials, representing disciplines hypothesized to influence the built environment at the municipal level, in urban areas with ≥50,000 residents. Elected officials targeted for this study represented mayors and municipal legislators such as city councilors, aldermen, selectmen, and policy staff. Appointed officials represented heads of departments of planning, community development, public works, transportation, engineering, parks and recreation, neighborhood services, and public health. Recruitment targeted 94 communities in 8 states (Colorado, Georgia, Hawaii, Kansas, Massachusetts, North Carolina, and West Virginia) with universities affiliated with the Physical Activity Policy Research Network, a research collaborative funded by the Centers for Disease Control and Prevention.[6] Participants were identified using the Municipal Yellow Book (www.leadershipdirectories.com), in addition to manual Internet searches for officials not included in the Yellow Book. Officials were invited by email to participate in the study. 463 individuals responded (response rate=26%). After excluding subjects with missing data for workplace zip code, 413 individuals representing 83 municipalities were included in the analyses.

Measures

Background on survey development for this study, which was guided by the Diffusion of Innovation Theory[7], has been previously published.[4] Conceptualized as the final stage of the innovation decision process, the dependent variable was participation in a municipal land use policy supportive of physical activity. Participants indicated whether they had ever participated in the development, adoption, or implementation of a municipal land use policy to increase mixed use, density, street connectivity, or pedestrian or bicycle access (yes/no). Two questions asked about perceived importance of physical activity and livability issues in their day-to-day job responsibilities using a 5-point scale. Two questions asked about perceived resident support of local government action to address physical activity and livability issues using a 5-point scale. Participants also indicated whether they lived in the city in which they worked (yes/no). City-level variables hypothesized to influence involvement in a local land use policy were collected from 2010 U.S. Census Data and included percentage of commuters by public transit, bicycle, and walking.[8]

Analyses

A two-level hierarchical logistic regression model was developed to identify individual (Level-1) and city (Level-2) characteristics associated with municipal officials' involvement in a local land use policy supportive of active living using R (V.3.0.2). The following multilevel model building approach was used: A null model for the binary outcome was fit to calculate the intraclass correlation coefficient. Second, Level-1 predictors were added to the logistic regression model as fixed effects. Third, Level-2 predictors were added simultaneously as fixed effects to the model with Level-1 predictors. The addition of each block of variables was evaluated using the Akaike Information Criterion (AIC). Next, random coefficient models were created to determine whether the slope for the Level-1 predictor of residence had a significant variance component. Random slopes were not statistically significant or large enough to retain in the final model.

Results

Participant characteristics

Participants were mostly male (70%), White (78%), had a college degree or higher (92%), and lived in the city where they worked (78%). Participants represented 83 municipalities (mean=4.9 municipal officials per municipality; range=1–18 municipal officials per municipality) across 8 states: North Carolina (24%), Colorado (20%), Missouri (17%), Georgia (12%), Massachusetts (12%), Kansas (11%), Hawaii (2%), and West Virginia (2%).

Multilevel model

Table 1 shows the final model. The null model with no predictors indicated that 3.65% of the variability in land use policy participation was accounted for by city differences. Higher perceived importance of physical activity to job responsibilities was inversely associated with land use policy involvement (OR=0.66; 95% CI=−0.65, −0.20). Higher perceived importance of livability issues to job responsibilities was positively associated with such policy participation (OR=1.81, 95% CI=0.33, 0.86). Participants residing in the city where

they worked were 1.88 times more likely to participate in a land use policy supporting active living than those not living near their workplace. Two city-level variables were significantly associated with participating in a land use policy: bicycling and walking commuter rates. For every 1-percent increase in the city-level bicycling rate, the odds of participation in a land use policy increased by a factor of 1.48 (95% CI=0.08, 0.71). Conversely, higher walking rates were inversely associated with land use policy participation (OR=0.94, 95% CI=−0.12, −0.01).

Conclusion

Understanding the individual- and community-level characteristics that influence policymakers' involvement in land use policies supportive of active living can identify leverage points for advocacy. While higher perceived importance of physical activity to day-to-day job responsibilities was inversely related to land use policy participation, higher perceived importance of livability issues to job responsibilities was positively related to land use policy engagement. This finding is consistent with a previous study that found livability to be a top motivation for planning officials to adopt an innovative land use policy, while enabling physical activity was a less important motivator.[3] Thus, it may be beneficial for health promotion advocates to frame land use policies supportive of physical activity in terms of other significant issues, such as livability.

Although participants representing cities with a higher proportion of commuters that walked to work were less likely to engage in a land use policy, those working in cities with a higher percentage of bicycle commuters were more likely to participate in a land use policy. Although not a measure of public support, this might suggest that municipal officials may be more likely to engage in a land use policy in cities where residents are supportive of bicycling rather than walking. Future research should explore the relationship between public support and officials' policy participation.

The study response rate was low, thus limiting the generalizability of findings. The cross-sectional data collected does not allow causal inference. Data were self-reported and thus potentially influenced by inaccuracies and social desirability bias. Differences in land use policy participation by elected or appointed status and length of time in the municipal official position were unable to be assessed, which warrants further study. City-level predictors represented walking, bicycling, and public transportation rates only for employed individuals commuting to and from work, not for recreation. Lastly, our model did not assess objective built environment attributes, which represents an opportunity for future research. Despite these limitations, this is one of the first studies to apply multilevel approaches to examine factors associated with land use policy involvement of municipal officials.

Findings from the current study can inform health promotion professionals seeking to advance local land use policies supportive of active living. Framing land use policy issues within the context of livability concerns may encourage municipal officials to become more engaged in these types of policies. Given that municipal officials representing cities with a higher proportion of bicyclist commuters were more likely to engage in land use policies, advocacy should also target communities where bicycling levels may not be as high. Future

research examining factors associated with the development, adoption, and implementation of policies supportive of physical activity should consider broader contextual factors that might impact these policy activities.

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So what? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

Previous research has explored the motivations of elected and appointed officials for participating in policies supportive of physical activity, but no study to date has examined contextual factors that may influence policy participation.

What does this article add?

This article adds evidence on the individual- and city-level factors that influence involvement in local land use policies supportive of active living by municipal officials. These findings suggest that a variety of individual- and city-level characteristics impact land use policy participation, including residence of the municipal official, perceived importance of livability issues to job responsibilities, and city-level bicycling rates.

What are the implications for health promotion practice or research?

Health promotion professionals seeking to advance local land use policies supportive of active living should frame issues within the context of livability concerns and consider public support for varying modes of active transportation.

Table 1

Factors Associated With Local Land Use Policy Involvement in Multilevel Analysis, (N = 413).*

Fixed Effects	OR (95% CI)
Intercept	0.51 (−1.67, 0.32)
Individual-level	
Perceived importance of physical activity in job responsibilities†	**0.66 (−0.65, −0.20)**
Perceived importance of livability in job responsibilities†	**1.81 (0.33, 0.86)**
Perceived resident support of local government to address physical activity†	1.20 (−0.15, 0.51)
Perceived resident support of local government to address livability†	1.09 (−0.22, 0.39)
Lives in the city in which they work‡	**1.88 (0.07, 1.19)**
City-level commuting variables	
% of public transit commuters	1.01 (−0.04, 0.07)
% of walking commuters	**0.94 (−0.12, −0.01)**
% of bicycling commuters	**1.48 (0.08, 0.71)**
Akaike information criterion	432.65

*Coefficients in bold are significant at $p < 0.05$. OR indicates odds ratio; and CI, confidence interval.

†Range from 0 to 4, with higher scores indicating greater perceived importance or support.

‡Yes = 1.